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Retrospective evaluation of 92 cases on the diagnosis and treatment of interstitial lung diseases

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Abstract

Aim: Interstitial lung diseases (ILDs) constitute a group of over 200 diseases affecting gas exchange, characterized by inflammation and fibroproliferation. The approach of a tertiary hospital to this heterogeneous group of diseases, which is challenging to manage, was reviewed to explore important features for diagnosis and treatment.

Material and Methods: Ninety-two patients evaluated for ILD at the Department of Chest Diseases, Abant Izzet Baysal University Faculty of Medicine, between January 1, 2018, and 2019, were examined in terms of demographic characteristics, clinical findings, pulmonary function tests, radiological images, diagnostic methods, and treatment modalities.

Results: A total of 92 patients, with a mean age of 62.23 ± 11.78- years (range: 32-88), including 69 males, were evaluated. The most common presenting complaints among symptomatic patients (92.4%) were dyspnea (77.6%) and cough (64.7%). Following clinical, radiological, and pathological evaluations, various ILDs were identified, predominantly idiopathic pulmonary fibrosis (25%), followed by nonspecific interstitial pneumonia (15.2%), pneumoconiosis (15.2%), sarcoidosis, hypersensitivity pneumonitis, drug-induced lung diseases, collagen vascular diseases, Langerhans cell histiocytosis, respiratory bronchiolitis-associated ILD, lymphocytic interstitial pneumonia, and cryptogenic organizing pneumonia. Diagnosis was established by clinical and radiological methods in 72 patients (78.3%), while invasive diagnostic methods, including bronchoscopy and mediastinoscopy were performed in 20 patients. It was observed that a definitive pathological diagnosis was reached in 22% of patients.

Discussion: Diagnosis of ILD relies on the interpretation of history, clinical findings, imaging modalities, and biopsy results. Considering that the inability to perform invasive procedures in patients presenting with advanced respiratory failure complicates diagnosis, it is recommended that patients, especially those in tertiary care hospitals, be evaluated by multidisciplinary teams.

Keywords

Hypersensitivity Pneumonitis, Idiopathic Pulmonary Fibrosis, Interstitial Lung, Disease, Sarcoidosis

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Introduction

Interstitial lung diseases (ILDs) constitute one of the most challenging patient groups in terms of diagnosis and treatment among those presenting to pulmonary clinics. Some of their etiologies are unknown, treatment is nonspecific, and the diseases are progressive. Development of inflammation and fibrosis is a common result in the latter stages of diseases. relies on the interpretation of history, clinical findings, imaging modalities, and biopsy results [1]. The introduction of high-resolution computed tomography (HRCT) has allowed for better visualization of the lungs and a better understanding of patterns related to ILDs. 3 Sometimes, despite the use of all diagnostic methods together, surgical procedures are required, and in most centers, diagnosis and treatment are planned by interpreting all results together in multidisciplinary steams. The diagnosis of interstitial lung diseases yields accurate results only in the presence of a multidisciplinary approach. We completed the diagnostic algorithms for all our patients in the study with an awareness of the importance of a multidisciplinary approach. In our study, we aimed to evaluate the demographic characteristics, clinical and radiological findings, diagnostic methods, treatment responses, and follow-ups of ILDs diagnosed at a tertiary care hospital. We anticipated that these findings could provide information about the ILD profile in our city.

Material and Methods

Patients who presented to the Department of Chest Diseases, Bolu Abant Izzet Baysal University Faculty of Medicine, between January 1, 2018, and January 1, 2019, and were evaluated as having ILD were retrospectively included in the study. Patient files were reviewed, and data including age, sex, occupation, symptoms, date of diagnosis, smoking history, comorbidities, medication history, method of diagnosis, parameters of pulmonary function tests, and findings of radiological imaging were recorded. For patients who underwent biopsy, the date of the pathology report was considered as the date of diagnosis, while for clinically and radiologically diagnosed patients, the date of the first CT scan showing findings was considered as the date of diagnosis. Spirometric tests (SFT) were performed using the MIR Spirolab 4.0 device. Patients were informed before the test, and they were tested approximately 2-4 hours after breakfast when they felt comfortable sitting in an upright position with a nose clip. Based on the measurements, a restrictive type respiratory function disorder was considered if the FEV1/FVC ratio was normal or high while the FVC was less than 80%. DLCO assessment was categorized as follows: DLCO ≥ 81% was Considered 'normal', DLCO between 61-80% was considered 'mildly reduced' DLCO between 41-60% was considered 'moderately reduced,' and DLCO ≤ 40% was considered 'severely reduced' [3] HRCT (high-resolution computed tomography) was performed to better evaluate the lung parenchyma and mediastinum and to determine the appropriate site for bronchoscopic biopsy. Radiological findings were recorded. Bronchoscopy was performed on patients with suitable clinical conditions to establish or confirm a histopathological diagnosis. Transbronchial biopsies were taken during bronchoscopy, and bronchial biopsies were performed in patients suspected of having sarcoidosis. For patients in whom results could not be obtained with these methods and tissue diagnosis was necessary, open lung biopsy was recommended. For those who agreed, lung biopsy was performed via horacotomy or video-assisted thoracoscopic surgery (VATS). During the diagnostic phase, the following criteria were considered: For patients suspected of sarcoidosis, ophthalmologic consultation was requested, and a tuberculin skin test with five units of tuberculin was performed. Induration diameter was measured at 72 hours, and values ≥ 5 mm were considered positive reactions. Diagnosis was based on clinically compatible features with multi-organ involvement, histologically demonstrated non-caseating granulomas, and exclusion of other diseases with similar clinical and histological features. When biopsy could not be obtained or was inadequate, patients were considered to have sarcoidosis if their clinical and radiological features were consistent with the diagnosis [4]. The diagnosis of idiopathic interstitial pneumonia and idiopathic interstitial fibrosis was made based on the criteria outlined in the consensus report of the American Thoracic Society (ATS) / European Respiratory Society (ERS) and taking into account the latest update recommendations. 6, 7 Patients with collagen vascular disease had previously been diagnosed or were diagnosed by our department. When their clinical and radiological features were consistent, they were considered to have lung involvement, and biopsy methods were not pursued. The diagnosis of hypersensitivity pneumonitis was based on suggestive history, exposure to a possible agent, partial clinical or functional improvement with avoidance of the responsible agent, restrictive pulmonary function tests, and the presence of ground-glass opacities and/or fibrosis on HRCT [8]. All patients included in the study were evaluated in terms of radiological examinations, all diagnostic interventions, biopsy methods, histopathological diagnosis rates, and obtained diagnoses. Subsequently, patients were grouped according to their diagnoses and examined. Group 1 (G1) consisted of ILDs associated with a known cause, Group 2 (G2) comprised granulomatous ILDs, Group 3 (G3) included idiopathic interstitial pneumonias, and Group 4 (G4) consisted of rarely seen ILDs.

Statistical Analyses

Descriptive statistics are presented as mean ± standard deviation or median (minimum - maximum) values for numerical variables, and as numbers and percentages for categorical variables. The normality assumption was assessed using graphical methods (histogram, QQ plot, etc.) and tests (Kolmogorov-Smirnov, Shapiro-Wilk, etc.). The choice of test also took into account the number of observations in each group. The Kruskal-Wallis test was used for comparisons among four groups in terms of numerical variables. For comparisons of categorical variables among groups, chi-square tests were utilized. Post-hoc tests were employed to determine which group or groups were different. Analyses were performed using IBM SPSS v.21. A significance level of p < 0.05 was considered statistically significant.

Ethical Approval

This study obtained approval from the Bolu Abant Izzet Baysal University Clinical Research Ethics Committee (Date: 2019-12-19, No: 2019/323).

Results

Ninety-two patients, ages 32 to 88, were included in the study. Among them, 23 (25%) were female and 69 (75%) were male, with a mean age of 62.23 ± 11.78 years. The majority of symptomatic patients (92.4%) presented with dyspnea (77.6%), cough (64.7%), and chest pain (35.3%) as the main symptoms. Upon examination of physical signs, the most common findings were fine crackles (61%), clubbing (23%), and rales (20%). Regarding occupational distribution, 29.3% were workers, 19.6% were housewives, 27.2% were farmers, and 23.9% were civil servants. The most common comorbidity was obstructive lung diseases (COPD, asthma) (48.1%), followed by hypertension, coronary artery disease, diabetes mellitus, and malignancies. The mean smoking history was found to be 35.12 ± 18.58 pack-years (ranging from 5 to 100 pack-years). Spirometric findings revealed a significant decrease in DLCO (56.563 ± 21.639), with a mean FVC of 83.760 ± 20.073 and a mean 6-minute walking distance of 373.958 ± 70.853 meters (Table 1). Upon examination of the patients' diagnoses and diagnostic methods, it was found that 23 patients had idiopathic pulmonary fibrosis (IPF) (25%), 14 patients had nonspecific interstitial pneumonia (NSIP) (15.2%), 14 patients had pneumoconiosis (15.2%), 10 patients had sarcoidosis (10.8%), 7 patients had hypersensitivity pneumonitis (HP) (7.6%), 6 patients had drug-induced lung diseases (6.5%), 6 patients had collagen vascular diseases (6.5%), 5 patients had Langerhans cell histiocytosis (LCH) (5.4%), 4 patients had respiratory bronchiolitis-associated ILD (4.3%), 2 patients had lymphocytic interstitial pneumonia (LIP) (2.1%), and 1 patient had cryptogenic organizing pneumonia (COP) (1%). According to the classification of ILDs, pneumoconiosis, drug-induced lung diseases, and collagen vascular diseases were included in Group 1 - ILDs associated with a known cause; sarcoidosis and hypersensitivity pneumonitis were in Group 2 - the granulomatous group; IPF, NSIP, respiratory bronchiolitis-associated ILD, LIP, and COP were in Group 3 - the idiopathic group; and LCH was in Group 4 - rarely seen ILDs group. The diagnosis was established by clinical and radiological methods in 72 patients, by video-assisted thoracoscopy in 10 patients, by mediastinoscopy in 7 patients, and by bronchoscopy (transbronchial-endobronchial

Table 1. Demographic, Clinical, and Functional Data

		Number	Percentage
		Mean ± Standard Deviation	
Gender	Female	23	25.0
	Male	69	75.0
Age		62.239	11.784
Smoking package (year)		35.127	18.589
Diseases	DM	16	20.8
	HT	28	36.4
	CAD	25	32.4
	Malignancy	12	15.6
	COPD/Asthma	37	48.1
	Others	35	45.5
Occupation	Farmer	25	27.2
	Homemaker	18	19.6
	Worker	27	29.3
	Civil servant	22	23.9
Symptoms	Cough	55	64.7
	Sputum	16	18.8
	Shortness of breath	66	77.6
	Chest pain	30	35.3
	Fatigue	14	16.4
	Fever	11	12.9
Physical Examination Findings	Crackles	36	61.0
	Rhonchi	12	20.3
	Erythema nodosum	6	10.2
	Uveitis	4	6.8
	Lymphadenopathy	5	8.5
	Clubbing	14	23.7
Pulmonary Function test	FEV1	77.387	19.549
	FVC	83.760	20.073
	FEV1 / FVC	74.453	11.096
	DLCO	56.563	21.639
	6DYT Starting SO2	95.188	2.623
	6DYT Finishing SO2	91.313	5.695
	6DYT Meter	373.958	70.853

biopsy and EBUS) in 3 patients. The diagnostic methods for diseases according to their etiologies are presented in Table 2. Radiologically, septal thickening, mediastinal lymphadenopathy, ground-glass opacities, traction bronchiectasis, honeycombing, emphysematous areas, and basal predominance were most commonly observed in Group 3 , while mosaic perfusion and upper lobe involvement were more common in Group 2, and pleural thickening was most frequently observed in Group 1. Significant differences were found among the groups for all radiological findings except consolidation, solitary pulmonary nodules, and bronchiectasis (Table 3). When spirometric and functional parameters were compared among the groups, the lowest values for FEV1, FVC, FEV1/FVC ratio, DLCO, 6-minute walking distance, and initial and final saturations were expectedly observed in Group 3, although this difference was not statistically significant.

Discussion

In this study, we aimed to evaluate the demographic characteristics, clinical and radiological findings, diagnostic methods, treatment responses, and follow-ups of ILD patients diagnosed at a tertiary care hospital. We emphasized the importance of a multidisciplinary approach in the management of ILDs. Although the precise epidemiology is unclear, ILD continues to be a significant cause of morbidity and mortality worldwide. In recent years, deaths due to idiopathic pulmonary fibrosis (IPF) and hypersensitivity pneumonitis (HP) have been reported to increase in the United States [14]. Studies on incidence have reported an annual incidence of 31 per 100,000 in various populations [8]. In a study by Musellim et al. involving 2,245 patients, the annual incidence of ILD in Turkey was found to be 25.8 per 100,000. 11 The same study reported sarcoidosis as the most common diagnosis at 37.6%, followed by IPF at 19.9%, pneumoconiosis at 11.8%, and HP at 4% . Similar to our study, the R-BILD Turkey study also identified IPF as the most common ILD. In our study, IPF (25.0%) among idiopathic interstitial pneumonias, pneumoconiosis (15.2%) among known causes, and sarcoidosis (10.8%) among granulomatous diseases were the most frequently identified ILDs. These findings are consistent with other studies conducted in Turkey [10, 11].

When examining the distribution of diseases by age and gender, ILDs peak in the 5th and 6th decades of life. IPF is more common in men and is most frequently observed in individuals over 75 years of age [6, 8, 12]. Baughman et al. found that 63.6% of sarcoidosis cases were female. 13 Consistent with the literature, 70% of sarcoidosis patients in our study were female, with an average age of 37.8 ± 10.2 years. In the IPF group, 87% were male, with a male/female ratio of 6.6, and the average age was 69.97 ± 8.5 years (Table 1). Women were most commonly diagnosed with sarcoidosis and HP, while IPF was most frequent in men. The relationship between diagnostic groups and gender revealed that the percentage of males was significantly lower in Group 2 (granulomatous diseases), a statistically significant finding (p = 0.039) (Table 1).

ILDs with established associations with smoking include idiopathic pulmonary fibrosis (IPF), desquamative interstitial

Table 2. Diagnostic Methods According to Etiologies

	Clinical-radiological	EBUS-FOB	VATS	MX	Percentage%
IPF	21	-	2	-	29.1
Pneumoconiosis	12	-	2	-	16.6
NSIP	11	-	3	-	15.2
Sarcoidosis	-	3	-	7	10
HP	7	-	-	-	9.7
Drug-Induced LD	6	-	-	-	8.3
Collagen Vascular Diseases	5	-	1	-	6.9
Langerhans Cell Histiocytosis	4	-	1	-	5.5
RB-LD	3	-	1	-	4.1
LIP	2	-	-	-	2.7
COP	1	-	-	-	1.3
TOTAL	72	3	10	7	100

Table 3. CT Findings According to Diagnoses

	G1	G2	G3	G4*	p
Septal Thickening	4 (15.4)	0 (0.0)	8 (19.0)	0 (0.0)	0.046
Mediastinal Lymphadenopathy	5 (19.2)	9 (52.9)	18 (42.9)	1 (14.3)	0.046
Ground Glass Density	2 (7.7)	7 (41.2)	17 (40.5)	2 (28.6)	0.012
Traction Bronchiectasis	9 (34.6)	1 (5.9)	20 (47.6)	0 (0.0)	0.001
Solitary Pulmonary Nodule	13 (50.0)	14 (82.4)	21 (50.0)	3 (42.9)	0.079
Honeycomb	3 (11.5)	2 (11.8)	15 (35.7)	0 (0.0)	0.014
Cyst	0 (0.0)	0 (0.0)	3 (7.1)	6 (85.7)	<0.001
Mosaic Perfusion	1 (3.8)	5 (29.4)	2 (4.8)	1 (14.3)	0.045
Consolidation	2 (7.7)	1 (5.9)	4 (9.5)	0 (0.0)	0.708
Bronchiectasis	1 (3.8)	0 (0.0)	1 (2.4)	0 (0.0)	0.719
Pleural Thickening	11 (42.3)	0 (0.0)	4 (9.5)	0 (0.0)	<0.001
Emphysematous Areas	4 (15.4)	1 (5.9)	13 (31.0)	4 (57.1)	0.021
Subpleural Preservation	0 (0.0)	0 (0.0)	11 (26.2)	0 (0.0)	<0.001
Irregular Reticulations	10 (38.5)	3 (17.6)	27 (64.3)	1 (14.3)	0.001
Basal Dominance	11 (42.3)	3 (17.6)	35 (83.3)	2 (28.6)	<0.001
Upper Lobe Involvement	5 (19.2)	7 (41.2)	6 (14.3)	5 (71.4)	0.007

*G1 Interstitial Lung Disease Associated with Known Cause, G2: Granulomatous Interstitial Lung Disease, G3: Idiopathic Interstitial Pneumonia, G4: Rare Interstitial Lung Disease

pneumonia (DIP), respiratory bronchiolitis-associated interstitial lung disease (RB-ILD), and histiocytosis X. [17, 18] In our study, 68.5% of patients had a history of smoking. This rate was 73% in patients with IPF and 85.7% in those with pneumoconiosis. However, among patients diagnosed with sarcoidosis, 80% were non-smokers, consistent with the literature [4, 16]. When evaluating the relationship between diagnosis groups and smoking status, it was found that the rate of smoking was significantly higher in Group 4, which comprises rare ILDs (p = 0.045). Looking at comorbidities, chronic obstructive pulmonary disease (COPD), hypertension, and ischemic heart disease were found to be the most common comorbidities in a study by Schwarzkop et al. [19] Similarly, in our study, these three diseases were observed as the most prevalent comorbidities.

Dyspnea is the most common symptom in ILD, particularly in IPF, with an incidence reported between 80-90.1% in various studies . Dyspnea is least common in sarcoidosis. [19] In our patients, the most frequently observed symptoms were dyspnea (77.6%) and dry cough (64.7%). Consistent with the literature, cough rates were 60% in sarcoidosis, 91.3% in IPF, and 71.4% in NSIP in our study. Reticular and interlobular septal thickening, ground-glass opacities, traction bronchiectasis, and honeycombing, predominantly with basal involvement, are the most common CT findings in ILD [18, 19]. In our study, septal thickening, traction bronchiectasis, honeycombing, and basal predominance were most frequently observed in Group 3, with significant differences between groups for these findings. However, there were no significant differences between groups in the frequency of consolidation, bronchiectasis, or solitary pulmonary nodules (Table 2). In the R-BILD study, the most common findings in the IPF group were interlobular septal thickening (72%), traction bronchiectasis (58.2%), honeycombing (69%), and basal predominance (57.8%), while in the sarcoidosis group, mediastinal lymphadenopathy (68.9%) was most frequent, and in the HP group, ground-glass opacities (75.9%) were the most common [10]. Pulmonary function tests (PFTs) are essential indicators in diagnosing and monitoring ILD and predicting mortality [20-22]. One study found that patients with a 5-10% decline in FVC had worse clinical outcomes than those with stable FVC values [20]. According to the British Thoracic Society's recommendations, in IPF patients, a decrease of more than 10% in FVC or more than 15% in DLCO within the first 6-12 months is associated with high mortality . 22 A study from our country indicated that FVC and DLCO values were not significant predictors of mortality; instead, the 6-minute walk test (6MWT) was the only independent functional parameter affecting mortality [22]. In our study, although the DLCO value was expectedly lowest in Group 3, there was no significant relationship between diagnostic groups and other PFT parameters, including walk tests (Table 3).

Regarding diagnostic methods, 78.3% of diagnoses were made using clinical and radiological methods, 10.9% through video thoracoscopy (VATS), 7.6% through mediastinoscopy, and 3.3% through EBUS and FOB. In the study by Şengül et al., 39.13% of diagnoses were made using clinical and radiological methods, 34.78% through bronchoscopy, 10.87% through mediastinoscopy, 8.7% through open lung biopsy, 2.17% through skin biopsy, and 1.09% through lymph node biopsy, renal biopsy, and pleural fluid analysis each [11]. The application rate of invasive biopsy methods in our study, as in the national and international literature, was low [22]. Therefore, our study aligns with the literature. Additionally, ATS and ERS recommendations state that open lung biopsy is not recommended if clinical, laboratory, and radiological features are typical for IPF and the biopsy results would not change the treatment decision [1].

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and Human Rights Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or compareable ethical standards.

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Conflict of Interest

The authors declare that there is no conflict of interest.

References

1. Raghu G, Remy-Jardin M, Myers JL, Richeldi L, Ryerson CJ, Lederer DJ, et al. ATS/ERS/JRS/ALAT clinical practice guideline. Am J Respir Crit Care Med. 2018;198:44–68.

2. Fishman AP, Elias JA, Fıshman JA. Fishman's Pulmonary Diseases and Disorders, 4th Edition. 2008.p.66-8.

3. Wagner J. Pulmonary Function Testing. A Practical Approach. 1st ed. USA: Williams and Wilkins. 1992.p.1-61.

4. Kaya A, Alper D. Sarcoidosis: Definition, Classification, Epidemiology, Sarcoidosis in the Light of Current Information. Scientific Medical Publishing House. 1999.p.5-11.

5. Travis WD, Costabel U, Hansell DM, King TE Jr, Lynch DA, Nicholson AG, et al. An official American Thoracic Society/European Respiratory Society statement: Update of the international multidisciplinary classification of the idiopathic interstitial pneumonias. Am J Respir Crit Care Med. 2013;188(6):733-48.

6. Montesi SB, Fisher JH, Martinez FJ, Selman M, Pardo A, Johannson KA. Update in Interstitial Lung Disease 2019. Am J Respir Crit Care Med. 2020;202(4):500-7.

7. Selman M, Chapela R, Raghu G. Hypersensitivity pneumonitis: Clinical manifestations, pathogenesis, diagnosis and therapeutic strategies. Semin Respir Crit Care Med. 1993;14:353-64.

8. Dove EP, Olson AL, Glassberg MK. Trends in idiopathic pulmonary fibrosis-related mortality in the United States: 2000-2017. Am J RespirCritCareMed. 2019;200:929-31.

9. Musellim B, Okumus G, Uzaslan E. Turkish Interstitial Lung Diseases Group. Epidemiology and distribution of interstitial lung diseases in Turkey. Clin Respir J. 2014;8:55-62.

10. Aycicek O, Cetinkaya E, Demirci Ucsular F, Bayram N, Senyigit A, Aksel N, et al. Research Burden of Interstitial Lung Diseases in Turkey – RBILD: Interstitial Lung Diseases in Turkey. 2022;39(1):e2022006.

11. Şengül B, Uzun O, Fındık S, Atıcı G. Examination of 92 patients diagnosed with interstitial lung disease in our clinic Tuberculosis and Thorax Journal. 2009;57(3):314-26.

12. Baughman RP, Teirstein AS, Judson MA. Clinical Characteristics of Patients in a Case Control Study of Sarcoidosis. Am J Respir Crit Care Med. 2001;15:1885-89.

13. Vassallo R, Ryu JH. Tobacco smoke–related diffuse lung diseases. Semin Respir Crit Care Med. 2008;29(6):643-50.

14. Hidalgo A. Smoking-related interstitial lung diseases: Radiologic-pathologic correlation. European radiology. 2006;16(11):2463-70.

15. Schwarzkop L, Witt S, Waelscher J, Polke M, Kreuter M. Associations between comorbidities, their treatment and survival in patient swith interstitial lung diseases – a claims data analysis. Respir Res. 2018;19(1):73.

16. Sinha A, Lee KK, Rafferty GF. Predictors of objective cough frequency in pulmonary sarcoidosis. Eur Respir J. 2016;47:1461-71.

17. George PM, Spagnolo P, Kreuter M, Altinisik G, Bonifazi M, Martinez FJ, et al. Progressive fibrosing interstitial lung disease: clinical uncertainties, consensus recommendations, and research priorities. Lancet Respir Med. 2020;8(9):925-934.

18. Schmidt SL, Sundaram B, Flaherty KR. Diagnosing fibrotic lung disease: when is high-resolution computed tomography sufficient to make a diagnosis of idiopathic pulmonary fibrosis? Respirology. 2009;14(7):934-9.

19. Elliot TL, Lynch DA, Newell JD Jr, Cool C, Tuder R, Markopoulou K, et al. High-resolution computed tomography features of nonspecific interstitial pneumonia and usual interstitial pneumonia. J Comput Assist Tomogr. 2005;29(3):339-45.

20. Zappala JC, Latsi PI, Nicholson AG, Colby TV, Cramer D, Renzoni EA, et al. Marginal decline in forced vital capacity in associated with a poor outcome in idiopathic pulmonary fibrosis. Eur Respir J. 2010;35(4):830-6.
21. Bradley B, Branley HM, Egan JJ, Greaves MS, Hansell DM, Harrison NK, et al. Interstitial lung disease guideline: The British Thoracic Society in collaboration with the Thoracic Society of Australia and New Zealand and the Irish Thoracic Society. 2008;63(Suppl 5):S1-58.
22. Canıvar C, Bingöl Z, Kılıçaslan Z, Çağatay T, Okumuş NG. Investigation of prognosis-related parameters in diffuse parenchymal lung diseases. Tuberk Toraks. 2017;65(3):210-219.
23. Nasser M, Larrieu S, Si-Mohamed S, Ahmad K, Boussel L, Brevet M, et al. Progressive fibrosing interstitial lung disease: A clinical cohort. Eur Respir J. 2021.11;57(2):2002718.
24. Pleasants R, Tighe RM. Management of Idiopathic Pulmonary Fibrosis. Ann Pharmacother. 2019;53(12):1238-48.

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